Point of Use Systems with Adsorptive Media for Arsenic Removal

Hanford, CA Water Forum

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About AdEdge Water Technologies

- Formed in 2002
- Headquartered in Atlanta, Georgia; Phoenix office
- Office / Multiple Sales Reps throughout country
- Over 500 Community Water Treatment installations for Public / Municipal sites totaling over 70 MGD capacity
- Initial company vision to serve the small water systems market for arsenic removal
- Expansion with focus on multi-contaminant removal
- 12 full scale EPA Arsenic Treatment Demonstrations
- Design and in-house manufacturing of systems

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Common Contaminants Treated

Arsenic	Iron, Manganese	Uranium, Radium
Heavy metals	Nitrates	Fluoride
Turbidity, Suspended Solids	TDS	VOCs

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About Arsenic

- Atomic number of 33
- Occurs naturally in groundwater mostly and some surface waters
- MCL is 0.01 mg/L or 10 ppb
- Carcinogenic with known chronic and acute health affects
- Co-contaminants sometimes present (U, Fe, Mn)
- Colorless, odorless
- Oxidation states As^{+3}, As^{+5}
- Occurs many PWS well sites; EPA estimates 800 water systems still not in compliance

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Common Arsenic Treatment Technologies

Arsenic Treatment Technology Overview	Features
Adsorption	• Simple • Lowest Capital Cost • Ideal for water with little Fe, Mn, or WQ interferences • Ease of operation
Oxidation / Filtration	• Excellent for co-contaminant removal • Ideal for waters with Fe, Mn, As • Low operating cost • Automated systems • E.g., AD26 technology
Coagulation / Filtration	• Use of Fe or other coagulant • Moderate Capital cost • Low Operating cost • Residuals Management is essential
Reverse Osmosis	• More complex & higher cost • Ideal for high TDS waters or co-contaminant removal • Not common for As removal

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Arsenic Adsorptive Media

- Iron-based adsorbent media
- Bayoxide E33 Granular Ferric Oxide media
- Dry, granular product
- High capacity commercial media
- Reduces As (III) and As (V)
- Operates over pH range (5.5 – 8.5)
- Non-hazardous waste when spent
- NSF 61 Certification
- 12 years of development and application, & commercial use
- Used in over 15 EPA Demo projects
- Recognized as the benchmark adsorption product

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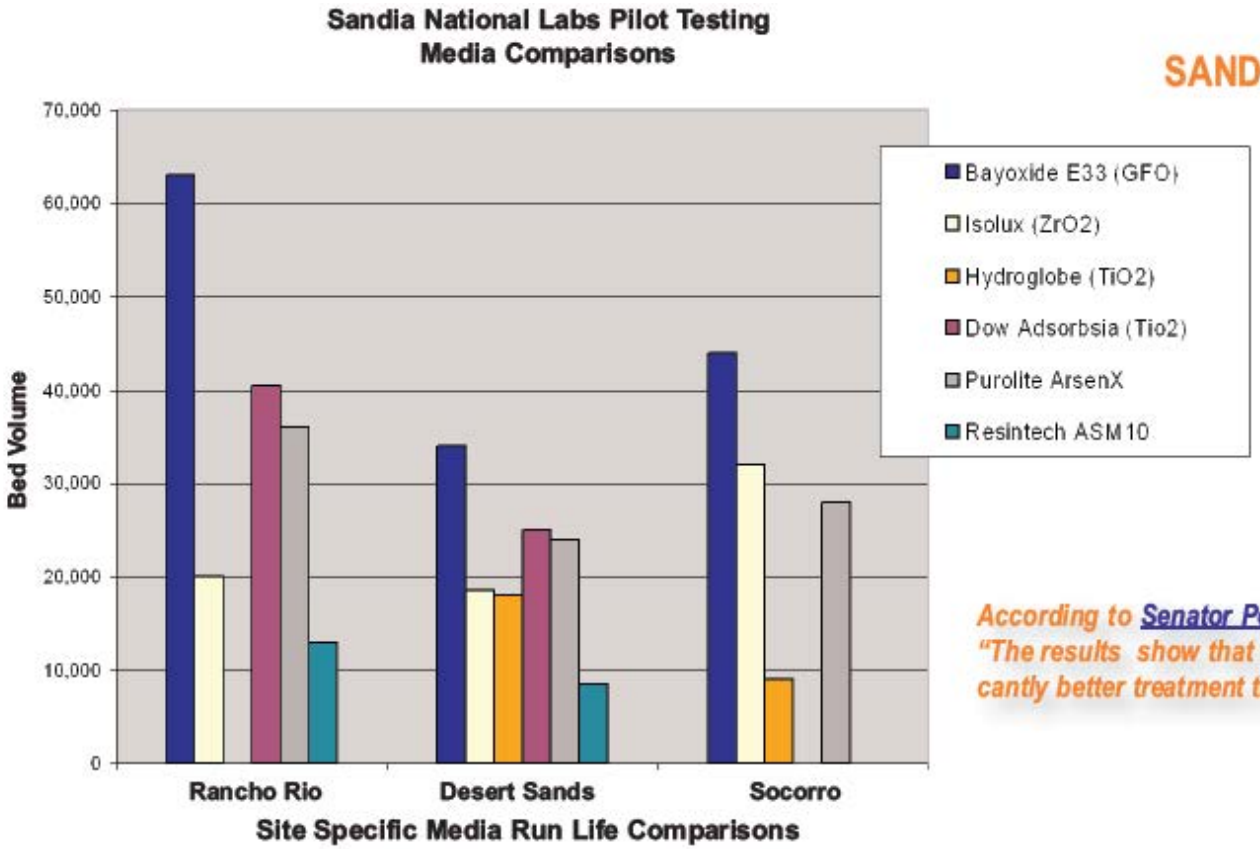
E33 Performance Data



SANDIA National Laboratories
Pilot Testing

Rancho Rio, NM
Desert Sands, NM
Socorro, NM

According to Senator Pete Domenici of New Mexico, "The results show that one material provides significantly better treatment than the others"

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Point of Use for Arsenic Removal

- Point of Use = Under the Counter treatment units.
- Treats water at the tap vs. whole house treatment
- NSF 53 certified
- California regulatory approval
- Each unit treats up to 1 gpm.
- Multiple units can be configured to treat higher flows.
- PID Performance Indicator
- Flow Meter with shut off valve

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Point of Use Cartridge

- Cartridge contains E33 adsorptive media and carbon block
- Sub-micron filtration – 0.5 micron
- ANSI/NSF Standards 42 and 53
- Over 57 contaminants treated including arsenic, lead, PCBs, VOCs, and others
- Treats arsenic up to 50 ppb
- Treats 960 gallons

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Arvin, CA Project – In Progress

- Project with RCAC and Community Water Center providing 39 POU arsenic removal systems to Arvin, CA
- Interim solution
- POU systems installed inside cabinets
- SWB funded project
- Installs to schools, parks, community centers
- First round of POU systems being installed June 2015

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